

T06D04 – Initial Inquiry into SpectroVis, [conc], and Beer's Law

The 2nd year IB students will hopefully finish up their Beers Law Lab in time for us to use the SpectroVis. The left over solutions (colored) of $\text{CoCl}_2(\text{aq})$, $\text{CrCl}_3(\text{aq})$, $\text{CuSO}_4(\text{aq})$, $\text{NiSO}_4(\text{aq})$, $\text{FeSO}_4(\text{aq})$, $\text{KCr}_2\text{O}_7(\text{aq})$ will be used to distinguish between the difference in the full absorbance spectrum of each.

Chemical Name	Chemical Formula	Concentration Used	Color of Solution
Cobalt (II) chloride	$\text{CoCl}_2(\text{aq})$	0.5 M	Red/Pink
Chromium (III) chloride	$\text{CrCl}_3(\text{aq})$	0.25 M	Dark Green
Copper (II) sulphate	$\text{CuSO}_4(\text{aq})$	0.5 M	Aqua Blue
Nickel (II) sulphate	$\text{NiSO}_4(\text{aq})$	0.5 M	Bright Green
Iron (II) sulphate	$\text{FeSO}_4(\text{aq})$	1.0 M	Faint Green
Potassium chromate	$\text{KCr}_2\text{O}_7(\text{aq})$	0.1 M	Yellow

In a small class you can use one or two computers, no use in everyone setting theirs up. This is strictly for conversation, discussion, and observation. Nothing formal will be collected.

Collect a full spectrum for each of the solutions, laying them each on the same graph. Then chose one solution and either make known concentrations (0.5, 0.4, 0.3, 0.2, 0.1, 0.05) or use concentrations left over from student unknowns (year 2 kids). Graph for Beers law choosing the λ_{max} appropriate for that solution and observing the change in absorbance for each known concentration.

Discussion:

SpectroVis: Pick apart each of the spectrums and lead students in a discussion on the relationship between absorbance, transmittance, and the color that the solutions appear.

Beer's Law:

Discuss the use of beers law for finding the unknown concentration of solutions. Discuss how the apparatus could be incorporated into a lab to determine rate of reaction.



